

EVALUATION OF LIVE INFECTIOUS BURSAL DISEASE (IBD) VACCINES BASED ON BURSAL BODY WEIGHT INDEX

EVALUASI VAKSIN INFECTIOUS BURSAL DISEASE (IBD) BERDASARKAN PADA NILAI INDEKS BURSAL

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ABSTRAK

Sesuai dengan persyaratan minimal Farmakope Obat Hewan Indonesia (FOHI), vaksin Gumboro yang dikenal dengan nama Infectious Bursal Disease (IBD) dinyatakan memuaskan apabila telah lulus uji umum (uji fisik, uji kevakuman, uji kemurnian dan uji steril) selain juga memenuhi persyaratan uji khusus (uji keamanan, uji potensi dan uji kandungan virus). Sejak tahun 1998, dalam uji keamanan (safety test), Balai Pengujian Mutu dan Sertifikasi Obat Hewan (BPMSOH) lebih menitik beratkan pada nilai Rasio Indeks Bursa yaitu nilai rata-rata berat bursa/bobot ayam hasil vaksinasi diperbandingkan dengan ayam kontrol tanpa perlakuan, dimana nilai tersebut harus sedikitnya mencapai nilai 0.7. Dari hasil tulisan disini, terdapat kegagalan dari beberapa vaksin IBD yang tidak memenuhi syarat untuk nilai Rasio Indeks Bursa setelah 5 (lima) minggu paska vaksinasi dengan menggunakan ayam Specific Pathogen Free (SPF) umur 2 (dua) minggu. Direkomendasikan untuk dilakukan penelitian lebih lanjut untuk menetapkan kembali Rasio Indeks Bursa pada Persyaratan Minimum Indonesia.

Kata kunci: Rasio Indeks Bursa, ayam SPF

ABSTRACT

To achieve a passed quality control of Infectious Bursal Disease live vaccine, it must follow under several tests such as general tests (Physic, vacuum extent, purity and sterile) and also special tests (safety, potency and virus content) as a regular tests that are written under Veterinary Drug Indonesian Pharmacopoeia. Since 1998, The Indonesian Veterinary Drug Assay Laboratory has used Bursal Body Weight Index (BBW Index) to evaluate live infections bursal disease vaccines. The Index compares the ratio of average wight of the bursa to the body beetwen vaccinated and non vaccinated chickens. The Index shoild at least be 0.7. Using the index, some vaccines fail to meet the requairement if they were tested five weeks pastraccination and compared with two-week old specific pathogen free chickens. Further study on the use of the index is needed.

Key words: BBW Index; SPF chickens

INTRODUCTION

More than 50% of infected chickens at once were died due to IBD virus and found since 1987, not only in Indonesia but also on farms raising pullets in

some countries. Especially in Indonesia at least sixty (60) IBD producers have been registered to provide IBD live vaccines not only mild but also intermediate more over intermediate plus to

eradicate this disease.

Intermediate IBD live vaccine preferred to be chosen because these strains have the capability to overcoming higher levels of maternal immunity than attenuated strains.

For mild live IBD vaccines, Specific Pathogen Free (SPF) Day Old Chicks (DOC) were used for safety test while intermediate and intermediate plus IBD live vaccines use 2 weeks old SPF chickens for their safety test as NVDAL routine method.

However there are some intermediate or intermediate plus strains failed to Indonesia Minimum Requirements. These facts perhaps due to many intermediate or intermediate plus IBD live vaccines cause more damaged on the Bursa *Fabricius* and gave lower BBW Index (< 0.7) as its consequence.

In this report is pointed out especially for safety test in terms of BBW Index of IBD live vaccines requirement.

MATERIALS AND METHODS

The below assays are carried out according to Indonesian Pharmacopoeia, where two weeks old of 10 specific pathogen free (SPF) chickens are used for vaccination group, whereas 10 unvaccinated SPF chickens are put as control group. Each group is housed in separate isolator in Bio Safety Level

(BSL) 2 plus building.

The vaccines are inoculated with 5 doses of manufacture recommended as per orally from each chicken. The chickens are reared and observed during 5 weeks. At the end of assay, all chickens are bled to examine the bursa *Fabricius* for gross pathology and BBW index calculation.

At the end of assay at least 80% of the vaccinated chickens must not show IBD clinical signs and BBW Index should be at least 0.7. The BBW Index is the ratio between the weight of the Bursa & the body weight of vaccinated birds divide ratio of non-vaccinated birds

RESULT AND DISCUSSION

In 1994 year until in 1997, in our laboratory, the judgment of bursa *Fabricius* were based on gross pathology in terms of no hemorrhage and no yellowish of the bursa at 5 weeks post vaccination.

However, entering 1998 year up till now, for safety test of IBD live vaccines, the bursa *Fabricius* are examined in terms of BBW index ≥ 0.7 (Ditjenak, 2007). There was only in 2003 year, that all (ten batches) IBD live vaccines (100%) were satisfied to favor BBW Index ≥ 0.7 , whereas less than 50% samples were not satisfied in 1999, 2001, 2005, 2007 and 2008 years as shown on the table 1:

Table 1: Percentage satisfied of Bursa Body Weight Index of IBD live vaccines tested during 1998-2009 year.

Years	IBD Vaccines number / batches tested											Percentage (%) Satisfied
	1	2	3	4	5	6	7	8	9	10	1	
1998												81.81
1999	0.5	0.8	0.4	0.8	0.8	0.5	0.3	0.6	0.8			44.44
2000	1.1	1.0	1.1	1.2	1.0	1.3	2.0					85.71
2001	1.4	0	1.1	0.9	0.3	0.5	0.6					42.85
2002	0.9	1	0.8	0.7	1.1	0.6	0.8	1.1				75.00
2003	0.7	0	0.7	0.9	1.3	0.8	0.7	7.1	1.4	1.4		100
2004	0.7	0	1.2	0.7	0.6	0.6	0.9	0.9	0.9	0.4		70.00
2005	0.6	1	1.1	0.3	0.3	0.3	0.3	0.9	1.0	0.3		40.00
2006	0.8	0	0.3	0.4	0.9							60.00
2007	0.7	0	0.2	0.2	0.2	0.9	0.8	0.2				33.33
2008	0.3	0	0.3	0.9	0.6	0.7	0.4	0.6	1.4			44.44
2009	0.3	1	0.3	0.9	0.9	0.7	0.3	0.7				62.50

There were still many IBD live vaccines favor BBW Index lower than minimum requirement. Perhaps it is caused by strain vaccines are intermediate or intermediate plus. Some researchers mention that BBW Index for mild type can be favored as ≥ 0.7 , whereas for intermediate type generally deliver 0.3 – 0.7 in range, while ≤ 0.3 usually is produced from Intermediate plus type. (Guitet, M. *et al* and Mazariegos *et al*, 1990).

There were categorized intermediate IBD live vaccines such 706; Cheville; D-78; E 228; Georgia; GM-97; KB-1; LC-75; LZD 228; MB; Moulthrop, SMJO; V 877. W 2512 G 61; W 2512 G 87, as and intermediate plus (hot) IBD live

vaccines like W 2512, whereas the mild ones were 1-65 PV; CA; Cu-1M; Lukert or Lukert CEO. In fact, actually there is no clear-cut division between “mild”, “intermediate”, “intermediate plus” and “hot”

During assaying in our laboratory, some IBD live vaccines were clearly mentioned to be categorized as intermediate or intermediate plus but some of them were not clear to be included in which groups.

It were found through figure 1 that average BBW Index in 1998 until 2009 appeared satisfied enough except in years of 1999, 2005 and 2007 as it showed from figure 1.

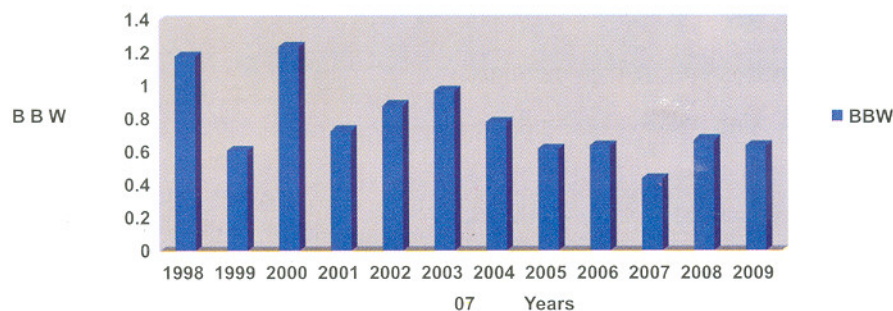


Figure 1. Average BBW Index of IBD live vaccines during 1998 – 2009 years

Though based on average BBW index, that only 3 years (1999, 2005 and 2007 years) favored unsatisfied result, but we have to consider also at Bursal Lesion Score (BLS) where judged under histopathologically changes although we understand that judgment for histopathologically sometimes is influenced a bit subjectivity. As Indonesian minimum requirement states that not only BBW Index must be satisfied but also BLS is important one since the last method is more sensitive.

Indonesia is a country like garbage country with using many vaccines, also with IBD live vaccine, many intermediate IBD vaccines are used even more pathogenic but its can induce an active response in the presence of higher levels of maternal immunity and therefore may induce active immunity earlier than the mild vaccine strains (Rosales, A.G *et al*, 1989), also all vaccines are not as efficient for protecting birds against bursal damage, the best results being obtained with the so called "intermediate" vaccines. (Vandenberg, T.P *et.al.*, 1991).

Also we have to consider in using a balance or same number and sex of chicken during test between vaccinated group and control group, since bursa of males is generally larger than females. (Glick, 1956).

Though there are some complaints from the distributors who have fail test for BBW Index, author believes that FOHI is still representative among ASEAN and OIE requirements.

ASEAN and OIE requirements do not mention bursal damage in detail (Anonymous) and OIE. 2008.

There are still found that some IBD live vaccines assay though match with other requirements (especially from their manufacturers itself) but fail

under Indonesia Veterinary Pharmacopea minimum requirement based on BBW Index.

Since Indonesia Veterinary Pharmacopea minimum requirement for BBW Index is written ≥ 0.7 , perhaps for intermediate plus vaccine perhaps should be considered lower than that requirement.

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